COVID-19 and SARS-CoV-2
Infection Prevention and Control
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State of the art SARS-CoV-2

Environmental specimens
- 585 samples collected from 2 batches of South China Seafood City (sampling on 1/1/20)
  - PCR tests showed that 33 samples + for SARS-CoV-2 nucleic acid
  - N-CoV was successfully isolated from + environmental specimens as well (ProMed)

Patient specimens
- BAL samples + viral isolation
- Nasopharyngeal/oropharyngeal (NP/OP) swabs + multiple studies
- Serology (Wan Zhong) + one patient and
- Stool RNA in the of infected patients (ProMed, Holshue NEJM 2020) and 1/3 of patients in the WHO
  - China Joint Mission
  - Exact duration of shedding not known with certainty

Healthcare workers (HCWs)
- 7% HCW infections reported in a series of 425 Chinese patients from Wuhan (Li, NEJM)
- Vast majority before outbreak recognized and most transmissions were at home
- Multiple HCWs reported confirmed cases inside and outside of China
- In a single-center series n= 138 hospitalized cases in Wuhan, China, presumed hospital-related transmission of SARS-CoV-2 was suspected in 41% of patients (Wang, JAMA)
- Recent paper Wuhan (CID March 2020) single highest RR was poor HH/poor adherence to technique despite full PPE use

Faculty/Presenter Disclosure

Financial disclosure affiliations – John Conly:
- Honoraria: None
- Speakers’ Bureau, advisory boards: Received funding to attend a meeting on HAI from the CDC and bioMerieux
- Grants/Clinical Trials: Local PI for the STRIVE S. aureus vaccine trial spinal surgery (Pfizer) and holds grants from CIHR, AI-HS, PHAC, AH, HHS, EDT.
- Patents, royalties: None
- Investments in health organizations: None
- Other influential affiliations: Member of committees with PHAC, WHO and CIHR

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Virus was readily isolated during the first week of symptoms from a considerable fraction of samples (16.66% in swabs, 83.33% in sputum samples).

No isolates of virus were obtained from samples taken after day 8 in spite of ongoing high viral loads by RT-PCR.

How COVID-19 spread compares

- Droplet and contact – multiple studies demonstrated compliance with gloves, gowns and medical masks or N95s were adequate to prevent transmission for SARS; major risks exposure of eye and mucous membranes to resp secretions and AGMPs, ie intubation (opportunistic airborne).

- HCW spread - associated with inconsistent or improper PPE use for SARS/MERS-CoV outbreaks; infections in HCWs: 22% and 25% for SARS and MERS, respectively.

- Risk factors for nosocomial spread of MERS-CoV in two large outbreaks in Saudi Arabia and South Korea found ER/Ward overcrowding and sub-optimal control of visitors were factors.

- Transmission of MERS-CoV was not documented in an investigation of mostly asymptomatic and pauci-symptomatic cases and their household contacts.

- Asymptomatic cases uncommon – one study of MERS cases found 80% of “asymptomatic” persons actually had symptoms on close questioning.
Interim IPC Recommendations

Personal Protective Equipment (PPE): Gowns, Gloves and Facial Protection
- Wear new PPE to enter patient room or bed space.
- Do not wear PPE outside a patient room or bed space unless transporting contaminated items.
- Remove soiled PPE as soon as possible.
- Gloves are single-use. Use only once, then dispose of immediately after use.
- Change gloves between care activities for the same patient (e.g., when moving from a contaminated body site to a clean body site). Sterile gloves are for sterile procedures.
- For more detailed information on glove use see [Hand Hygiene and Selection of PPE](https://www.albertahealthservices.ca/assets/healthinfo/ipc/hi-ipc-emerging-issues-ncov.pdf).
- Prescription glasses do not meet Workplace Health and Safety regulations for eye protection.
- Proper wearing of masks includes:
  - ensuring a snug fit over the nose and under the chin;
  - changing mask when it becomes moist;
- Refer to the [N95 Donning and Doffing PPE posters](https://www.albertahealthservices.ca/assets/healthinfo/ipc/hi-ipc-emerging-issues-ncov.pdf) for details on careful removal and disposal of PPE.

N95 Respirators & Eye Protection
- Use O2 or when Aerosol Generating Medical Procedures are performed. See the [Respiratory Hygiene](https://www.albertahealthservices.ca/assets/healthinfo/ipc/hi-ipc-emerging-issues-ncov.pdf) for a list of AGMP.
- All staff and physicians require fit-testing for an N95 respirator.
- Perform hand hygiene before putting on and immediately after taking off N95 respirator.
- Proper wearing of an N95 respirator includes:
  - pulling on the respirator before entering the patient's room;
  - covering the metal bar over the nose;
  - ensuring an airtight seal on the face, over top of the nose and under the chin;
  - performing a pressure test (P2P test);
  - leaving the room and changing the respirator when it becomes moist;
  - removing the respirator after leaving the patient's room by touching elastic only;
- not wearing respirator around the neck.
- Refer to the [Aerosol Management and Patient Care](https://www.albertahealthservices.ca/assets/healthinfo/ipc/hi-ipc-emerging-issues-ncov.pdf) for details on careful removal and disposal of N95 respirators.

Handling Patient Care Items and Equipment
- Use disposable patient equipment when possible.
- Dedicated re-useable equipment for a single patient use only, until discharge.
- If necessary equipment cannot be dedicated for a single patient use, clean and disinfect it between patients.
- Additional Precaution rooms should contain a dedicated linen bag, double bag only if leaking.
- Do not share items that cannot be cleaned and decontaminated.
- Used meal trays and dishes do not require special handling. Disposable dishes and utensils are not required.
- Special handling of linen or waste is not required.

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Building upon key existing WHO guidance

Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected
Interim guidance
25 January 2020

Advice on the use of masks in the community; during home care and in health care settings in the context of the novel coronavirus (2019-nCoV) outbreak
20 January 2020

Table I: Persistence of coronaviruses on different types of inanimate surfaces

Table II: Sensitivity of coronaviruses for different species of insectivorous bats in captive study

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